

Bid or No Bid Decision Making Tool Using Analytic Hierarchy Process

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In today's complicated business environment, bid or no bid decision is crucial for construction companies. Moreover, poorly made bidding decisions could cause severe problems. For example, not bidding a favorable project (i.e., which supports the company to survive in the industry) could result in lost opportunities for companies to make profit, improve contractors' strength in the industry and gain a long-term relationship with a new client. On the other hand, bidding a project that actually does not fit the company's profile (i.e., company's strategy and future vision considering monetary and non-monetary contributions of the project) requires a lot of time, effort, and commitment without a favorable outcome. Even though various key factors that affect bid/no bid decision have been identified and numerous decision-making models have been developed in literature since the mid-1950s, a practical solution for decision makers has not been sufficiently researched. For the purpose of this study, a decision making tool will be developed to help the decisionmakers to select the most appropriate projects to bid on and thereby minimizing the abovementioned risks. Analytic Hierarchy Process (AHP) will be used as the analysis method in this research. In this method, the main problem is divided into hierarchies as sub-problems, which are then, addressed using pairwise comparisons. By using pairwise comparisons, the weights for the key factors for bid/no bid decisions will be determined. The following steps will be performed in this study: i) Considering that most of the existing research has already focused on the determination of the key factors, to expedite the research process, the key factors will be selected from the literature. Specifically, the factors that are determined through a comprehensive literature review will be grouped according to their similarities (e.g., reputation of the client and the client honesty factors will be grouped under "owner identity" factor) and most-commonly identified factors will be determined (Phase I). ii) In Phase II, Step-1, the key factors identified in the Phase I, will be submitted to the survey respondents in a pairwise comparison table in excel. The respondents will be asked to identify which factor is more important than the other and how much more important that factor is over the other one by indicating absolute numbers provided in the AHP comparison scale (1 to 9). The results of the survey will enable the research team to prioritize the key factors using AHP. As a part of this step, the demographics of the companies (e.g. contractor type, size, revenue) will also be collected. iii) In Phase-II, Step-2, a pilot group, which consists of 3 to 5 companies, will be selected for the validation of the study and they will be provided with four different hypothetical case studies, which were created based on the key factors and input from a consultant in the construction industry with experience in working for multiple contractors in different types of projects. First, the participants will be asked to give their bidding decisions by considering the hypothetical project conditions without using any decision-making tools or statistical approaches. Secondly, after gathering the results from the previous step, they will be provided by the Bid/No Bid Decision Making tool, through which they can repeat the same decision making process but this time using the Bid/No Bid Decision Making tool. The results of the two approaches (with decision making tool and without decision making tool) will be compared and the accuracy of the "Bid or No Bid Decision Making Tool" will be tested. The preliminary results show that the prioritizations of the key factors are influenced by the company type and the company size (Revenue). Furthermore, Residential, Commercial, Industrial and Heavy/Highway Construction companies consider different key factors in evaluating their final bidding decisions. Differences were also identified between general contractors' and subcontractors' results, for example "Need for work" was selected as the most effective key factor by the general contractors while "Contract conditions and type of contract" was the top choice by the subcontractors. It should be stated that the limited sample size (n=48) of this study might be influential on the results. Therefore, larger sample size might improve the results in future studies. Through this research it is expected to gain more knowledge on the key factors that affect bid or no bid decisions. Therefore, the development of the bid/no bid decision making tool, will provide practical solutions to the questions of (i) whether to bid on a project or not and (ii) which project(s) to bid on given a few candidate projects.